Remarks/Arguments

Claim 49 is amended. Claims 30-71 are pending in the application. Claims 30-48 and 51-71 are withdrawn. Support for the amendment to claim 49 can be found at paragraphs [0061] – [0063] of U.S. Pub. No. 2007/0205700A1. Reexamination and reconsideration of the application, as amended, are respectfully requested.

Claim Rejections Under 35 USC § 103

Claims 49-50 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Kida (U.S. Pat. No. 6,511,763). Applicants respectfully traverse this rejection.

Claim 49 is as follows:

> A multi-layer piezoelectric device made by stacking piezoelectric layers and internal electrodes alternately one on another, wherein the piezoelectric layer contains $PbTiO_3$-$PbZrO_3$ as a main component and contains Si of not less than 5 ppm and less than 100 ppm;
>
> wherein the grain boundary has single molecules of SiO_2 and has no glass phase containing SiO_2.

Applicant respectfully submits that Kida fails to disclose or teach, at least, a multi-layer piezoelectric device having a "grain boundary [that] has single molecules of SiO_2 and has no glass phase containing containing SiO_2." As such, Kida et al. cannot render claim 49 obvious.

Kida discloses PbO containing piezoelectric materials that have glass phases at the closed region which contains SiO_2 (col. 2, ll. 15-16 & 22-24). The Office Action also states that Kida teaches providing a piezoelectric PZT material that includes Si in an amount less than 100 ppm in order to increase strength. Applicant

respectfully disagrees. Kida teaches the use of network-forming oxides, such as SiO_2 and Al_2O_3, in amounts of 100-700 ppm to form a glass phases having SiO_2 and ceramic grains that produce greater mechanical strength, higher resistance to chemicals, and high stability of other characteristics in the resulting ceramic (col. 2, ll. 34-43). In contrast amended claim 49 requires "not less than 5 ppm and less than 100 ppm" in order to produce a piezoelectric ceramic having no SiO_2 in a glass phase.

Kida uses SiO_2 in connection with one or more other network forming oxides to form glass phases in which the $Si0_2$ is present in the piezoelectric ceramic within the resulting glass phase (col. 2, ll. 34-43). As such, Kida does not teach or suggest the piezoelectric layers as claimed in amended claim 49 because Kida discloses the use of SiO_2 in glass phases and amended claim 49 requires a piezoelectric material which "has no glass phase containing SiO_2." Accordingly, Kida is not obvious over claim 49. Likewise, dependent claim 50 is also patentable over Kida for at least the same reasons as claim 49. Applicant respectfully requests that the Office withdraw the rejection.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (310) 785-4600 to discuss the steps necessary for placing the application in condition for allowance.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
HOGAN & HARTSON L.L.P.

Date: March 23, 2009

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